DESCRIPTION

PAPER PACKAGE AND STRAW

Technical Field

This invention relates to a press-deformable paper package and a straw wherein contents of juice, refreshing drinks, particularly, jelly food and the like contained in a paper package are drinkable by an external pressure without using a sucking force.

Background Art

As illustrated in FIG. 16, a paper package 1 containing various kinds of refreshing drinks such as milk, a refreshing drink, juice and the like has an insertion section 2 into which a straw 3 is thrust in a top surface section 9 of the package to drink various kinds of refreshing drinks therein to allow drinking from an upper end of the straw whose tip end is thrust into a sealed film covering the insertion section. Unexamined Japanese Patent Publication 2000-313435 discloses such straw 3 which has a tip end that is obliquely shaped to be easily thrust into the insertion section 2 and which is attached to an outer surface of the package in a state that it is contained in a transparent bag 5.

The conventional straw 3 is formed longer than the height of the paper package 1, and is obliquely attached to the outside of the package and the tip end inserted into the insertion section 2 has a length reaching a bottom of the package, and the tip end of the straw reaches the bottom even if a liquid level of the contents falls, thus making it possible to drink the contents put to one side by inclining the package without leaving them. However, when a person holds the straw thrust into the insertion section 2 in his/her mouth and drinks the contents while sucking the straw or the contents are transferred to a feeding bottle or a cup, the interior of the package is gradually decompressed to make it impossible to draw the contents through the straw upon flow of the contents outside, and as a

result there is need to press the package from outside to improve internal pressure.

When the package in which the contents are reduced by drinking is inverted, the tip end of the straw is exposed from the refreshing drink, so that he/she cannot drink the contents. Moreover, since the straw 3 with a cross-section of the same shape was simply thrust into the insertion section 2, there was a possibility that the straw would be easily detached from the insertion section 2 when being erroneously pulled outward, causing the contents to flow from the package to dirty a dress and the like. Straws with consideration given to such a problem of the conventional straw are disclosed in Unexamined Japanese Patent Publication 2002-249172 and Unexamined Japanese Patent Publication 2002-355161.

As illustrated in FIG. 1, an improved straw 4a, which is to be inserted into an insertion section 36 formed in a press-deformable package 20 made of paper and the like, has a stop section 6 of an arbitrary shape at its substantially intermediate portion and is hooked on the insertion section 36. A through hole 7 is formed at a position with a distance, which is substantially the same as a width W of material that forms the package 20, from the stop section 6 and an oblique opening 8 is formed at the tip end of the straw, respectively. The number of through holes 7 may be one or multiple. The refreshing drink in the package is made to flow through the through hole 7 besides the opening 8, making it possible to drink the refreshing drink.

In the case where the contents are transferred to the cup or feeding bottle through the straw 4a thrust into the insertion section 36, one or two or more through holes 7 are formed close to the stop section 6 of the straw, so that the refreshing drink in the package 20 is taken in through the opening 8 or the through hole 7 to make it possible to transfer to the other container. In this case, with the conventional long straw, the reduction of the refreshing drink in the package causes the tip end of the straw to be exposed outside the refreshing drink, making it impossible to drink the contents, however, since the straw 4a illustrated in FIG. 1 has the through

hole 7 close to the wall surface of the package 20 in addition to the opening 8 formed at the tip end, it is possible to drink the contents completely and transfer them if the package is inverted (FIG. 14).

In another improved straw 4b illustrated in FIGS. 2 to 4 using the principle of the aforementioned straw 4a, the tip end thereof has an oblique opening 8a formed at an tip end of a taper cylinder 11 that is taper shaped to be easily thrust into the insertion section 36 formed in the package, and an intermediate portion has a stopping portion 6a having substantially a taper-shaped diameter and a stopper function, a step portion 6a, and a through hole 7a close to the stop section in order to prevent easy detachment of the straw4b thrust into a bellows portion 10 that is extendable and bendable in a fixed range and the insertion section 36. The straw illustrated in FIG. 3 has the vertical step portion 6b, which is continuous to a maximum outer diameter portion of the stop section 6a, on a straw outer periphery surface, and the straw illustrated in FIG. 4 has the step portion 6b, which is formed vertically from an end portion of a cylinder section 6c being continuous to the maximum outer diameter portion of the stop section 6a and having a reinforcing function, in such a manner to be continuous to a base section 12 on the straw outer periphery surface.

When the contents of the package 20 are reduced to expose the opening 8a at the tip end of the straw 4b outside the refreshing drink (FIG. 14), the contents enter the straw through the through hole 7a. In other words, when the person sucks the straw 4b thrust into the insertion section 36 while holding the straw in his/her mouth with the bottom of the package 20 upward, he/she can drink the contents completely. Moreover, in the case of transferring the contents to the cup or feeding bottle, since the contents can be taken in through the through hole 7a even if the residual quantity is reduced to expose the opening 8a of the straw outside the refreshing drink, it is possible to transfer the contents to the other container.

Though the typical conventional paper package 1 is illustrated in FIG. 16, thick paper material with a water-proof thin film 13 such as aluminum foil, polyethylene resin, etc. on its inner surface (FIG. 14) is cylindrically

shaped, its upper and lower edges are brought in close contact with each other to be bent in a square box shape, triangular projections, which are projected to the upper and lower and right and left of both lateral surfaces respectively, are bent downward, and the lateral surfaces and the bottom surface are adhesively bonded to each other to assemble the entirety in a rectangular box shape.

Disclosure of Invention

The water-proof film, which seals the insertion section 2 formed in the top surface section 9 of the paper package 1, comes in close contact with the outer periphery surface of the straw and seals the outer section when the straw 3 is thrust thereinto, and when the person sucks the contents with the straw held in his/her mouth, the package is pressed from outside and deformed by a negative pressure caused in the interior of the package 1 according to reduction in the contents. After that, when the straw 3 is removed from his/her mouth, air is taken into the interior by the negative pressure and the package is returned to the original condition, the person sucks the straw again while holding the straw in his/her mouth again to drink the contents by repeating the above. Generally, it is common that the person holds the straw with his/her mouth to drink the contents of the package by a sucking force.

However, in the case of the contents of viscous liquid having viscosity such as a jelly drink rather than a solution such as a refreshing drink, a strong sucking force is required to drink them through the straw. For this reason, it was difficult for persons such as infants, sick persons, old persons, who were too weak physically to produce a strong sucking force, to drink the contents.

Furthermore, there is a package made of soft resin material, for example, soft material such as polyethylene resin, aluminum foil wherein a person holds a squeezable package in his/her hand and presses out a jelly drink as contents while squeezing them. In this case, there were problems in which a strong force for squeezing was required instead of the sucking

force, the cost of package material was increased, and much time was required for garbage disposal since packages whose contents were drunk up had to be sorted.

An object of the present invention is to provide a paper package and straw wherein a press-deformable paper package is pressed and folded from the outside thereof to make it possible to drink contents therein completely without the need of a sucking force and transfer the contents to the other container.

The present invention is a paper package wherein thick paper material having a waterproof thin film on its inner surface is cylindrically formed, its upper and lower edges are sealed and bent to form a top portion 35 and a bottom portion 24 opposite to each other, a front portion 30 and a back portion 38 opposite to each other, a pair of lateral surfaces 25, 25, triangular projections 21, 21 disposed upward and projected right and left are brought in close contact with the lateral surfaces 25, 25, triangular projections 22, 22 disposed downward and projected right and left are brought in close contact with the bottom portion 24 to form a square box shape, an insertion section 36 for inserting a straw is formed on the top portion 35, and the upper triangular projections 21, 21 are weakly bonded to the lateral surfaces 25, 25 by thermal processing or heat treatment. Since the triangular projections are weakly bonded to the lateral surfaces, they can be easily peeled off from the lateral surfaces without causing damage on the nails and the upper portions of the lateral surfaces of the package are easily folded to allow the contents to be pushed out.

Moreover, the present invention is a paper package wherein thick paper material having a waterproof thin film on its inner surface is cylindrically formed, its upper and lower edges are sealed and bent to form a top portion 35 and a bottom portion 24 opposite to each other, a front portion 30 and a back portion 38 opposite to each other, a pair of lateral surfaces 25, 25, triangular projections 21, 21 disposed upward and projected right and left are brought in close contact with the lateral surfaces 25, 25, triangular projections 22, 22 disposed downward and projected right and left are

brought in close contact with the bottom portion 24 to form a square box shape, an insertion section 36 for inserting a straw is formed on the top portion 35, and the upper triangular projections 21, 21 are sealed and wrapped around the lateral surfaces 25, 25 with a film 40. Since the triangular projections are peeled off from the lateral surfaces by breaking the film, the upper portions of the lateral surfaces of the package are folded to allow the contents to be pushed out.

Furthermore, the present invention is a paper package wherein thick paper material having a waterproof thin film on its inner surface is cylindrically formed, its upper and lower edges are sealed and bent to form a top portion 35 and a bottom portion 24 opposite to each other, a front portion 30 and a back portion 38 opposite to each other, a pair of lateral surfaces 25, 25, triangular projections 21, 21 disposed upward and projected right and left are brought in close contact with the lateral surfaces 25, 25, triangular projections 22, 22 disposed downward and projected right and left are brought in close contact with the bottom portion 24 to form a square box shape, an insertion section 36 for inserting a straw is formed on the top portion 35, and the pair of lateral surfaces 25, 25 has inverted V-shaped folds 27, 27 deciding triangular surfaces 27a, 27a of isosceles triangular shape using base portions 26, 26 that are intersections formed by the lateral surfaces 25, 25 and the bottom portion 24 as base sides and vertical folds 29, 29 extending to vertexes 23, 23 of the upper triangular projections 21, 21 from vertexes 28, 28 of the triangular surfaces 27a, 27a. Thus, since the vertical folds formed on the paired lateral surfaces of the square box shape whose upper and lower edges are sealed are connected to the vertexes of the inverted V-shaped folds disposed downward, the triangular surfaces disposed on the lower portions of the lateral surfaces are projected outward and the lateral surfaces are folded in two and made flat to allow the contents to press outward.

Moreover, in the present invention includes a first horizontal fold 31 passing through both vertexes 28, 28 of the triangular surfaces 27a, 27a and being in parallel with the bottom portion 24. For this reason, the front

portion of the bottom portion of the square box shape can be folded flat on the front portion.

Still moreover, in the present invention, the first horizontal fold 31 passes through at least one of the front portion 30 and the back portion 38. The first horizontal fold 31 may be formed on the front portion 30, and even if it is formed on the back portion 38, a similar function can be obtained.

Still moreover, in the present invention, a distance d1 between the first horizontal fold 31 and the bottom portion 24 is 1/2 of a width w1 of the bottom portion 24. For this reason, the front portion of the bottom portion 24 can be folded flat on the front portion 30 with the first horizontal fold 32 inside.

Still moreover, the present invention includes at least one auxiliary fold 32 having a distance corresponding to a natural number multiple of a width w1 of the bottom portion 24 from the first horizontal fold 31, and being parallel with the first horizontal fold 31. In such a large-sized container, if the auxiliary fold 32 is formed on the front portion 30, the contents are moved upward while the bottom portion 24 folded flat on the front portion 30 is bent sequentially, making it possible to push the contents outward from the straw.

Still moreover, the paper package includes a second horizontal fold 34 passing through both vertexes 23, 23 of the upper triangular projections 21, 21 and being in parallel with the top portion. For this reason, the front half of the top portion 35 is folded flat on the front portion 30 with the second horizontal fold 34 formed on the front portion inside without peeling off the upper triangular projections 21, 21 from the lateral surfaces 25, 25, making it possible to press the contents outward.

Still moreover, in the present invention, a distance d2 between the second horizontal fold 34 and the top portion 35 is 1/2 of a width W2 of the top portion 35. For this reason, the front portion of the upper surface 35 can be folded flat on the front portion 30 with the second horizontal fold 34 inside.

Still moreover, in the present invention, the insertion section 36 is

disposed on a back surface potion of the top portion 35 and the second horizontal fold 34 passes through the front portion 30.

Still moreover, in the present invention, contents having viscosity of 10 mPa· s and more are packed. In the case of the refreshing drinks, it is possible to suck them by even a weak sucking force since the viscosity is low, however, in the case of the contents having a high viscosity such as rice gruel, it is difficult to suck the contents unless a strong sucking force is generated. For this reason, according to the present invention, even when the strong sucking force is required, for example, in the case of eating the contents having a high viscosity of 10 mPa· s and more, it is possible to easily eat them by only a pressing force from outside without the need of the sucking force.

Still moreover, the present invention is a straw that is a straw 4b removably secured to a straw insertion section 36 formed on a press-deformable package 20, including a cylindrical base section 12; a stop section 6a connected to an inner surface of the package to prevent detachment of the straw; and at least one through hole 7a being adjacent to the stop section, wherein a total of an opening area of the through hole is equal and greater than a cross section of the base section in a diameter direction.

Still moreover, in the present invention, the stop section 6a has a taper portion with its outer diameter gradually decreasing to the through hole side from an opening for drinking.

Still moreover, in the present invention, a maximum outer diameter of the taper portion of the stop section 6a is smaller than a sum of an outer diameter of the base portion 12 and a thickness of a straw tube wall and greater than the outer diameter of the base portion.

The present invention is the paper package and straw which includes a foldable package and viscous fluid and which facilitates the flow of contents, and since the contents of the press-deformable package are drunk, even if a person does not suck the straw thrust into the insertion section of the

package or cannot suck the straw, guiding folds are formed to fold the package flat and the package is pressed from outside to be deformed flat to allow the contents to be pressed outward from the straw. Though the strong sucking force is required to drink the contents having a high viscous fluid, even persons such as infants, old persons, sick persons, who are too weak physically to generate a strong sucking force, can press the contents of the package outward by the pressing force from outside to make it possible to drink them.

Brief Description of Drawings

FIG. 1 is a cross-sectional view of a first straw;

FIG. 2 is a plane view of a second straw;

FIG. 3 is an enlarged cross-sectional view of a general part of FIG. 2;

FIG. 4 is an enlarged cross-sectional view of a general part illustrating another embodiment of a straw;

FIG. 5 is a perspective view of a paper package according to the present invention;

FIG. 6 is a front view of a state in which triangular projections of an upper portion of the package are bent upward;

FIG. 7 is a front view of a state in which a front portion, which forms a top portion of a package where a straw is thrust into an insertion section, and a back surface are respectively made flat and are brought in close contact with each other;

FIG. 8 is a plane view of a state in which a front half of a package bottom portion is folded to a front side from a first horizontal fold and is made flat;

FIG. 9 is a plane view of a state in which a bottom portion is folded upward to a front side from an auxiliary fold and is made flat;

FIG. 10 is a plane view of a state in which a bottom portion is folded upward to a front side from a second auxiliary fold and is made flat;

FIG. 11 is a perspective view of a paper package of a second embodiment;

FIG. 12 is a plane view of a state in which the same package is folded flat;

FIG. 13 is a back view of FIG. 12;

FIG. 14 is a cross-sectional view of a state in which a straw is thrust into an insertion section of a package;

FIG. 15 is a side view of a state in which three paper packages are wrapped together with a transparent film; and

FIG. 16 is a perspective view of a conventional paper package.

Best Mode for Carrying Out the Invention

The following will specifically explain embodiments of the present invention with reference to the accompanying drawings.

Referring to the explanation of a press-deformable package 20 illustrated in FIG. 5, a pair of both lateral surfaces 25, 25, a front portion 30 and a back portion 38 of a box shape 15, which is formed in such a way that thick paper material having a water-proof thin film 13 (FIG. 14) on its inner surface is cylindrically shaped and its upper and lower edges are sealed and bent, and upper and lower portions of the front surface and the back surface are bent flat to be projected right and left to form triangular projections 21, 21, 22, 22, respectively. The lower triangular projections 22, 22 are bent downward to be bonded to a lower surface of a bottom portion 24, respectively (FIG. 6). Moreover, the upper triangular projections 21, 21 are bent downward and weakly thermal bonded to the lateral surfaces 25, 25 (FIG. 6).

At the lower portions of the paired lateral surfaces 25, 25 provided in the square box shape 15 that forms the package 20, there are disposed triangular surfaces 27a, 27a formed by base portions 26, 26 that are edges of the bottom portion 24 and inverted V-shaped folds 27, 27 that connect vertexes of edge lines of right-angled isosceles triangles using the base portions as bottom sides. Moreover, vertexes 28 of the inverted V-shaped folds are connected to vertical folds 29 vertically formed in intermediate portions of the lateral surfaces, and upper ends of the vertical folds 29 are

extended to upper ends of the lateral surfaces. Furthermore, a first horizontal fold 31, auxiliary folds 32, 33 are formed in a front surface 30 in order from the lower portion to be parallel with the bottom portion 24, respectively, and an insertion section 36 through which the straw is thrust is formed in a top portion 35.

An upper surface of the press-deformable package 20 is brought in close contact with both lateral surfaces 25, 25 by downward folding the triangular projections 21, 21 projecting to the right and left of the top portion 35 that is made flat in substantially parallel with the bottom portion 24, or the triangular projections 21, 21 are weakly bonded to the lateral surfaces by thermal processing or heat treatment. In other words, bonding strength can be freely adjusted by controlling heating temperature or heating time. More specifically, the bonding strength is set to preferably 15N/15 mm or less and more preferably 10N/15 mm in order that even persons such as infants, sick persons, who are weak physically, can easily feel the triangular projections 21, 21. The triangular projections 21, 21 are folded downward to be brought in close contact with the lateral surfaces 25, 25, and sealed and wrapped with a transparent film 40 from outside thereof, thereby reinforcing the lateral surfaces 25, 25 placed at the upper portion of the package 20.

In the case where three packages 20 are wrapped with the transparent film to be easily dealt as one pack as illustrated in FIG. 15, the upper triangular projections 21, 21 are brought in close contact with the lateral surfaces 25, 25 to reinforce the upper portions of the lateral surfaces by the film. In the case where the number of packages 20 is one and the outside of the package is not wrapped with the transparent film 40, the triangular projections 21, 21 are weakly bonded to the lateral surfaces 25, 25 by thermal processing or heat treatment to reinforce the upper portions of the lateral surfaces 25, 25.

The triangular projections 22, 22 that project right and left at the lower portions of the package 20 are folded to the lower surface of the bottom portion 24 and are integrally bonded thereto, and the lower portions of the

lateral surfaces 25, 25 are reinforced by the base portions 26 placed at the edges of the bottom portion. Accordingly, both lateral surfaces 25, 25 of the package 20 are reinforced by the upper and lower triangular projections 21, 21, 22, 22 to allow the square box shape 15 to be maintained.

When the upper triangular projections 21, 21, which are in close contact with the lateral surfaces 25, 25, are peeled off by breaking the transparent film 40 or the upper triangular projections 21, 21, which are weakly bonded to the lateral surfaces 25, are peeled off by a long nail with polish, a weak force may be required, so that nail polish is not removed and the long nail is not cracked. If the triangular projections 21, 21 are bent upward to be positioned horizontally (FIG. 6), strength of the upper portions of the lateral surfaces 25 in an axial direction are lost. For this reason, when both corner portions A, A (FIG. 5) of the upper portions of the package are pressed from outside, respectively, the upper portions of the lateral surfaces are folded in two with vertical folds 29, 29 upward, the triangular projections 21, 21 are cancelled, the front portion 30 and the back portion 38 are folded in two from the vertical folds 29, 29 and made flat, and the upper portions of the package are deformed flat by a pressing force applied from outside to allow the contents to be pressed outward through the straw 4b (FIG. 7).

Though the contents such as refreshing drinks having a low viscosity can be sucked even if the sucking force is low, it is appropriate that an upper limit of viscosity of jelly food such as rice gruel be one million mPa· s and that a lower limit thereof be 10 mPa· s and more. Namely, in the case of the contents having a high viscosity, sick persons, old persons and the like can not eat the contents unless they suck the straw with a strong sucking force, however, according to the present invention, it is possible to press out the contents by pressing the package from outside without the need of sucking force. Accordingly, care assistants except such persons press the package to make it possible to have such persons eat the contents.

At the lower portion of the front portion 30, there is formed a first horizontal fold 31, which is parallel with the bottom portion 24, is formed by connecting an intersection of horizontal lines S, S, which pass through the vertexes 28, 28 of the inverted folds 27, 27 disposed at the lower portions of the lateral surfaces 25, 25 of the package and the front portion 30, so that a substantially front half of the bottom portion can be folded flat on the front portion 30 with the fold 31 inside when both corner portions B, B at the front side of the bottom portion 24 of the package are pressed obliquely upward (FIG. 8). When the front half of the bottom portion 24 with width W1 is folded on the front portion 30 with the first horizontal fold 31 inside, in the lower portions of the lateral surfaces 25, 25, the triangular surfaces 27a, 27a having the vertexes 28, 28 at which the inverted V-shaped folds 27, 27 are folded and projected outward are projected to both outsides of the bottom portion 24.

The bottom portion 24 and the respective triangular surfaces 27a placed at both sides of the bottom portion form a bottom part integrally with the bottom portion 24 , the front portion of the bottom portion folded with the first horizontal fold 31 inside is folded on the front portion 30, the vertical folds 29, 29 connecting to the vertexes 28, 28 project outward, the lateral surfaces 25, 25 are folded in two, the front portion 30 and the back portion 38 are folded flat, and the contents flows outward through the straw inserted into the insertion hole 36.

Since the first horizontal fold 31 disposed in parallel with the bottom portion 24 is formed on the front portion 30 and a distance between the fold 31 and the bottom portion 24 is set to a length d1 corresponding to a half of width w1 of the bottom portion 24, the front half of the bottom portion 24 folded with the first horizontal fold 31 inside is folded flat on the front portion 30 (FIG. 8).

An auxiliary fold 32 is formed in parallel with the first horizontal fold 31 disposed on the front portion 30 of the package and with substantially the same distance as width w1 of the bottom portion 24, and when the package 20 is long, a second auxiliary fold 33 may be formed as required so that the

bottom portion 24 is sequentially folded in the same direction to press out the contents of the package (FIG. 10).

As mentioned above, since the vertical folds 29, 29 vertically disposed at the intermediate portions of both lateral surfaces 25, 25 and the vertexes 28, 28 of lower inverted V-shaped folds 27, 27 are connected, when the upper triangular projections 21, 21 are separated from the lateral surfaces 25, 25 and are positioned horizontally (FIG. 6) and, thereafter, the respective intersections A, A, A, A of both upper end corners are pressed and folded from outside and both corners B, B of the lower front side are pressed obliquely upward, the bottom portion 24 is folded flat with the first horizontal fold 31 inside as illustrated in FIG. 8. Since the first horizontal fold 31, the auxiliary folds 32, 33 are disposed on the front portion 30 from the lower portion, the vertical folds 29 are projected outward and are folded in two and made flat on both lateral surfaces 25 and the front half of the bottom portion 24 with width w1 is folded flat on the front portion 30 with the first horizontal fold 31 inside, allowing the contents to be pressed out.

Referring to the explanation of another embodiment of the present invention based on FIG. 11, a small-size press-deformable package 20a with capacity of about 100 to 125 ml has substantially the same shape as that of FIG. 5 and some difference in folds therefrom, upper and lower ends of cylindrical-shaped thick paper material are sealed and bent to the square box shape 15 to form both lateral surfaces 25, 25, the front portion 30, and the back portion 30, and the upper and lower portions of the square box shape 15 are formed flat. The upper and lower triangular projections 21, 21, and 22 and 22 (FIG. 8), which are formed by projecting the upper and lower portions of the package 20a right and left, are bent downward, respectively, the upper triangular portions 21, 21 and the lower triangular portions 22, 22 are bonded to the lateral surfaces 25, 25 and the lower surface of the bottom portion 24, respectively. In addition, the same reference numerals as those aforementioned indicate the same portions as those aforementioned.

At the lower portion of the square box shape 15, the vertexes 28, 28 of

the inverted V-shaped folds 27, 27, which connect vertexes of edge lines of right-angled isosceles triangles using the base portions 26 that are edges of the bottom portion 24 as bottom sides, are connected to the vertical folds 29, 29 that are vertically placed at the intermediate portions of the lateral surfaces 25, 25. The upper portions of the vertical folds 29, 29 are connected to one ends of horizontal lines T, T passing through the lower portions of the upper triangular projections 21, 21, and connects an intersection of the other ends of the horizontal lines T, T and the front portion 30, so that a second horizontal fold 34, which is parallel to the bottom portion 24, is formed on the front portion 30. Moreover, at the lower portion of the front portion 30, there is formed the first horizontal fold 31 disposed on a straight line that connects the intersection of the horizontal lines S, S, which pass through the vertexes 28, 28 of the inverted V-shaped folds 27, 27, and the front portion 30. Additionally, unlike FIG. 5, the insertion section 36 formed on the top portion 35 is formed on a side opposite to a side having a package ear portion 35a, and even if the top portion 35 of the front side of the package ear portion 35a is folded on the front portion 30 with the second horizontal fold 34 inside, the top portion at the side having the insertion port 36 is not positioned at the side where it is folded with the second horizontal fold 34 inside, so that an excessive force is not applied to the straw inserted into the insertion hole 36.

In the case of drinking the contents of the package 20a, when the person thrusts the straw into the insertion section 36 and holds the end portion of the straw in his/her mouth and presses both upper sides of the front portion 30 and the back portion 38 of the package downward and both lower front sides upward from outside, the lateral surfaces 25, 25 are folded in two and made flat by projecting the vertical folds 29, 29 disposed at their intermediate portions upward, thus making it possible to the contents to be pressed outward through the straw thrust into the insertion section 36.

When the package 20a is folded in a state that the second horizontal hold 34 disposed on the upper portion of the front portion 30 and the first horizontal fold 31 disposed on the lower portion are positioned inside,

respectively, the top portion 35 and the bottom portion 24 are made flat on the front portion 30 to press the package from outside, making it possible to press the contents outward. As illustrated in FIGS. 12, 13, the bottom portion 24 and the top portion 35 are made flat and are folded on the front portion 30, so that the interior of the package is narrowed. In this case, when the front portion 30 and the back portion 38 are pressed from outside, the front half of the top portion 35 with width W2 is folded on the top portion 30 with the second horizontal fold 34 inside and the front half of the bottom portion 24 is folded on the front portion 30 with the first horizontal fold 31 inside, so that the package 20a is folded flat. In the back view of the package, the back portion 38 is plane shaped as illustrated in FIG. 13 and the package is crushed flat to make it possible to press out the contents through the straw 4b by the pressing force from outside without the need of sucking force. Particularly, in the case of the small-size package of about 100 ml or 125 ml, unlike FIG. 5, there is no need to form the auxiliary folds 32, 33 on the front portion 30. Accordingly, unlike the first embodiment, since there is no need to peel off the triangular projections 21, 21 from the lateral surface 25, no damage is caused to the nails and this offers convenience to the sick persons having handicapped finger tips, old persons, and infants.

Thus, the package 20 is pressed from outside and is folded flat, persons such as sick persons, old persons, infants, who are weak physically, can press the contents with high viscosity outside the package through the straw and eat them safely without the need of sucking force. The press-deformable package used here includes a paper package, a plastic package and the like, and indicates a general package formed of material that is folded flat by being pressed outside.

Referring to the explanation of the straw of the embodiment of the present invention, the straw, made of paper material, synthetic resin, is cylindrically shaped, and includes the stop section having the bellows portion 10, which is bendable from the opening for drinking at its intermediate portion of the straw, and a taper portion that gradually

decreases toward the top end, the through hole 7a formed close to the stop section 6a, a taper cylinder 11, and an opening 8a, respectively. When being thrust into the insertion section 36, the taper cylinder 11 can be guided to the taper portion to be correctly thrust thereinto even if it is slightly deviated from the center. The through hole 7a has an opening area, which is equal and greater than a cross section of the straw in a diameter direction. The opening area mentioned here indicates an area on a plane where the outer periphery surface of the straw is developed. In other words, when the size of the opening area of the through hole formed on the straw is below the cross section of the straw, there is a possibility that a force required for pressing out will be excessively increased. Moreover, in view of the point that strength of the straw is ensured, the opening area of the through hole is preferably three or less times larger than the cross section of the straw.

The stop section 6a of the straw is formed to have the taper portion whose outer diameter is tapered toward the through hole 7a from the opening for drinking. Then, it is required that a maximum outer diameter of the stop section be smaller than a sum of an outer diameter of the straw and a tube wall thickness of the straw. For example, the outer diameter of the straw is 6. 3 mm, the tube wall thickness is 1 mm, and the maximum outer diameter, which is the sum of both, is 7. 3 mm. Then, when the maximum outer diameter of the stop section 6 is 7.3 mm or more, there occurs a manufacturing problem in which the stop section 6a of the straw cannot be thrust into the insertion section 36 of the package. Furthermore, it is required that a minimum outer diameter of the stop section 6a be shorter than the straw outer diameter of 6. 3 mm. Accordingly, since the stop section 6a has the taper portion that gradually decreases toward the through hole from the opening for drinking, such an effect is provided that the straw is easily inserted into the insertion section 36 and is less prone to be detached therefrom once it is inserted.

Example

Viscous fluid of 30 ml was packed in the interior of the paper package

20, a fixed external pressure of 5 kPa was applied to the package, and time until all of the contents of 30 ml were discharged was measured, obtaining the following result. Here, the cross sectional outer diameter of the conventional straw is 5 mm or 6 mm, and the tube wall thickness is 1. 0 mm. In contrast to this, the outer diameter of the present straw is 6. 3 mm.

Conventional straw 4 seconds

Present straw 2 seconds

In the case of drinking the contents of viscous fluid by use of the straw, the straw 4b using the present invention reduced the time to a half as compared with the conventional straw 3.